

U.S. EPA Non-Road Diesel Compliance Testing Engine set-up Requirements

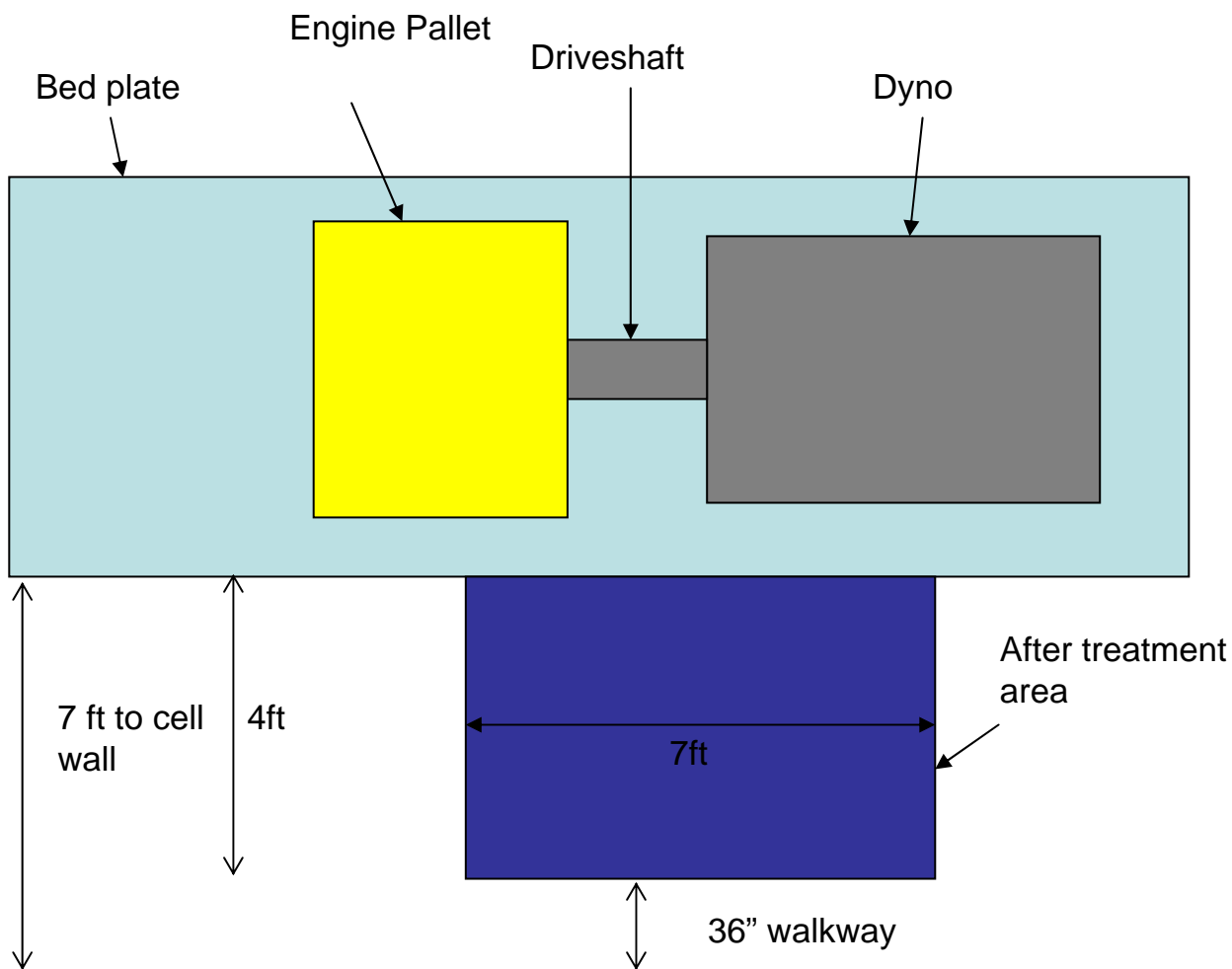
August 29, 2006

- 1. Engine must be supplied with the matching turbo to exhaust flange and an appropriate clamp.**
- 2. Engine must be supplied with a detailed drawing (wrap drawing or outline drawing), including dimensions, of the engine mounting pads front and rear.**
- 3. Engine must be supplied with a standard SAE type bell housing.**
- 4. A dynamometer flywheel adapter plate must be supplied machined with the NVFEL's driveshaft pattern. (See attached drawing)**
- 5. Engine must be supplied with an engine test cell wiring harness that has throttle signal (0-5V DC), ECM power, grounds and also switched power for the ignition. Also it must have a diagnostic port J1708 or J1939. The harness should be at least 8ft long from ECM to Test Cell interface. All wires must be clearly marked and identified. The manufacturer is responsible for bringing their respective diagnostic software, data link and notebook computer to diagnose engine.**
- 6. The rotational inertia of the engine with the attached flywheel must be supplied with the engine.**
- 7. Fuel inlet and return should have a JIC fitting. The size should be determined by the engine manufacturer.**
- 8. Temperature requirements: The locations should be clearly marked and have a 1/4 ntp boss to install a thermocouple fitting into.**
 - Oil sump**
 - Coolant in**
 - Coolant out**
 - Fuel in**
 - Fuel return**
 - Turbo Compressor air out**
 - Intake manifold in**
- 9. Pressure requirements: The locations should be clearly marked and have a -4 JIC fitting installed.**
 - Oil galley pressure**
 - Turbo Compressor out pressure**
 - Intake manifold pressure**
 - Coolant block pressure**
 - Fuel inlet pressure**
- 10. Fuel return pressure**
- 11. The engine must be supplied without an air pump and shall have the correct block off plate installed.**
- 12. The front accessory drive should have a minimal amount of accessories to allow the engine to run properly. If accessories are needed, they should be supplied with all the support equipment required to run and maintain them.**
- 13. The turbocharger compressor outlet and intake manifold should have elbows that allow adjustment of placement or if hard mounted point straight out from the engine or straight forward.**

- 13. Air inlet to engine or turbocharger should be located above the valve cover. The inlet should point vertical and be able to be attached to a 5" or 6" rubber hose.**
- 14. A blow-by hose and all the associated hardware required to attach it to the engine must be supplied.**

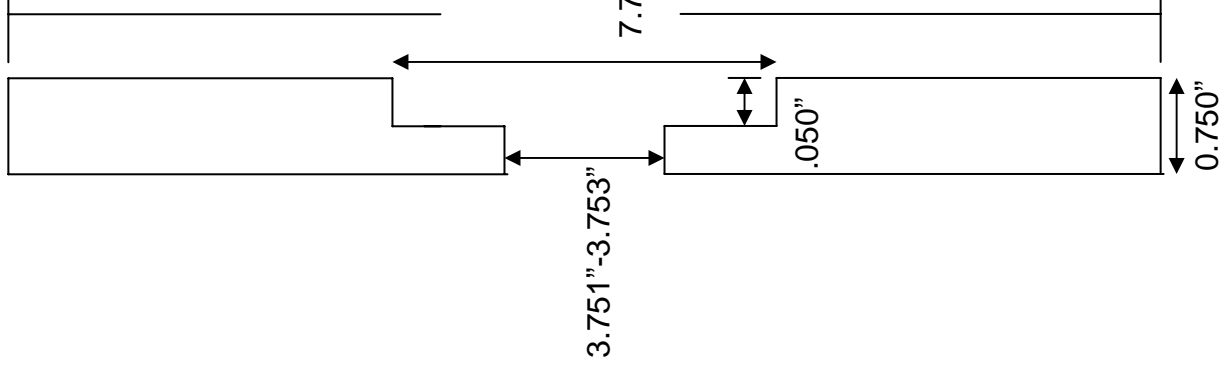
Non-Road Diesel After-treatment Space requirements

- 1. The space available in HD5 for after treatment is approximately 4ft wide by 7 ft long. The space is illustrated on the attached picture.**
- 2. The after-treatment system cannot be taller than 75" due to the height of the CVS tunnel.**
- 3. The after-treatment system must have one inlet and one outlet.**
- 4. The inlet and outlet must have a marmon flange affixed to both ends.**
- 5. Any engine after treatment systems must be maintained by their own ECM or controlled by the engine ECM**
- 6. There is DC power available from 0-30 volts and 0-50 amps.**
- 7. All systems must be freestanding. The system should stand on its own without having to be affixed to the floor in any way.**
- 8. All wiring harness for the engine to the after treatment must be at least 8 feet long from ECM to test cell interface.**



Flywheel Adapter

Side view



Drill thru 7/16 bolt clearance
12 equal spaced holes at 16.63" bolt circle

The Driveshaft Flanges that we use are a Dana Spicer 1810. This Flange uses a 7.25" Bolt circle . The Material We recommend is a 1040 CRS steel.

There should be 16 bolt holes
equally spaced. Drilled and tap
for a 7/16"-20 UNF Thru bolt

